

WHAT IS CLAIMED IS:

1. A photosensor system comprising  
a photosensor array constituted by two-  
dimensionally arraying a plurality of photosensors,  
5 an image reader which reads a subject image at a  
predetermined reading sensitivity by the photosensor  
array:

sensitivity-adjusting reader which reads the  
subject image while changing an image reading  
10 sensitivity of the photosensor array at a plurality of  
stages;

optimal image reading sensitivity extraction means  
for extracting an optimal image reading sensitivity  
suitable for the image reading operation on the basis  
15 of a predetermined measurement amount relating to  
an image pattern of the subject image read by the  
sensitivity-adjusting reader; and

reading sensitivity setting means for setting  
the optimal image reading sensitivity to a reading  
20 sensitivity of the image reader.

2. A system according to claim 1, wherein the  
sensitivity-adjusting reader reads the subject image by  
setting different image reading sensitivities stepwise  
for respective rows of the photosensor array.

25 3. A system according to claim 1, wherein the  
sensitivity-adjusting reader reads the subject image by  
setting different image reading sensitivities stepwise

for photosensors of a specific row section of one to several specific rows of the photosensor array.

4. A system according to claim 3, the  
5 photosensor array are photosensors of one specific row.

5. A system according to claim 3, further  
comprising abnormal pixel determining means for  
determining whether the specific row section contain an  
abnormal pixel by checking whether the measurement  
10 amount corresponding to one column of the specific row  
section has changed each time the image reading  
sensitivities are switched from one to another.

6. A system according to claim 5, further  
comprising sensitivity-adjusting read controlling means  
15 for executing the sensitivity-adjusting reading  
operation with respect to a specific row section other  
than the specific row section if the abnormal pixel  
determining means determines that the abnormal pixel  
exists in the specific row section.

20 7. A system according to claim 1, wherein the  
predetermined measurement amount in the optimal reading  
sensitivity extraction means is lightness data  
corresponding to the image pattern of the subject image  
read by the sensitivity-adjusting reader.

25 8. A system according to claim 1, wherein the  
image reading sensitivity of the photosensor array is  
set by adjusting a charge accumulating period of the

photosensor.

5 9. A system according to claim 1, which further comprises, in the image reader and the sensitivity-adjusting reader in the photosensor array, an effective voltage adjuster which applies to each photosensor a correction signal for setting to optimal values effective voltages of signal voltages applied to each photosensor.

10 10. A system according to claim 1, wherein the optimal reading sensitivity extraction means comprises:

15 measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by a the sensitivity-adjusting reader;

20 dynamic range calculation means for calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity; and

25 maximum dynamic range extraction means for extracting an image reading sensitivity having a maximum dynamic range among dynamic ranges of measurement amounts calculated for each image reading sensitivity.

11. A system according to claim 10, wherein the measurement amount comparison means extracts the maximum and minimum values of the measurement amount in a predetermined column range of each row.

5 12. A system according to claim 1, wherein the optimal reading sensitivity extraction means comprises:

displacement calculation means for calculating a displacement of the measurement amount relating to the image pattern of the subject image between image reading sensitivities on the basis of the subject image read by the sensitivity-adjusting reader; and

10 maximum displacement extraction means for extracting an image reading sensitivity having a maximum displacement among displacements of measurement amounts between image reading sensitivities.

15 13. A system according to claim 12, wherein the displacement calculation means calculates a differentiated value of the measurement amount on predetermined columns of each row.

20 14. A system according to claim 1, wherein the optimal reading sensitivity extraction means comprises:

measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reader;

25 dynamic range calculation means for calculating

a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity; and

5           maximum dynamic range extraction means for extracting an image reading sensitivity at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic range between image reading sensitivities  
10           minimizes.

15           15. A system according to claim 1, which further comprises abnormal value removing means for removing an abnormal value deviating from a main change trend of the measurement amount, from the measurement amount relating to the image pattern of the subject image read by the sensitivity-adjusting reader.

20           16. A system according to claim 15, wherein the abnormal value removing means removes the abnormal value by performing Fourier transformation for the measurement amount and removing a predetermined high-frequency component from the frequency-converted measurement amount.

17. A system according to claim 1, which further comprises:

25           measurement amount comparison means for extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for

each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reader;

a dynamic range calculation means for which calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity;

specific value extraction means for extracting for each image reading sensitivity a specific value at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic range between image reading sensitivities maximizes; and

abnormality determination means for which determining presence/absence of an abnormality contained in the subject image on the basis of the specific value.

18. A system according to claim 1, wherein

each of the photosensors has a source electrode and drain electrode formed via a channel region made from a semiconductor layer, and a top gate electrode and bottom gate electrode formed at least on and below the channel region via insulating films,

either of the top gate electrode and bottom gate electrode is used as a light irradiation side, and

charges corresponding to a light quantity irradiated from the light irradiation side are

generated and accumulated in the channel region.

19. A drive control method for a photosensor system having a photosensor array constituted by two-dimensionally arraying a plurality of photosensors comprising :

executing a sensitivity-adjusting reading operation of reading a subject image while changing an image reading sensitivity of the photosensor array at a plurality of stages;

extracting an image reading sensitivity suitable for reading operation of the subject image on the basis of a predetermined measurement amount relating to an image pattern of the subject image read by the sensitivity-adjusting reading operation;

setting the extracted image reading sensitivity as a reading sensitivity in the reading operation of the subject image; and

executing image reading operation of reading the subject image at the set reading sensitivity.

20. A method according to claim 19, wherein the sensitivity-adjusting reading operation is executed by setting different image reading sensitivities stepwise for respective rows of the photosensor array and reading the subject image.

21. A method according to claim 19, wherein the sensitivity-adjusting reading operation is performed by reading the subject image at different image reading



sensitivities that are set stepwise for photosensors of a specific row section of one to several specific rows of the photosensor array.

22. A method according to claim 21, wherein the  
5 photosensors of the specific row section of the photosensor array are photosensors of one specific row.

23. A method according to claim 21, further comprising determining whether the specific row section contain an abnormal pixel by checking whether the  
10 measurement amount corresponding to one column of the specific row section has changed each time the image reading sensitivities are switched from one to another.

24. A method according to claim 23, further comprising executing the sensitivity-adjusting reading  
15 operation with respect to a specific row section other than the specific row section if the abnormal pixel determining step determines that the abnormal pixel exists in the one specific row section.

25. A method according to claim 19, wherein the  
20 predetermined measurement amount is lightness data corresponding to the image pattern of the subject image read by the sensitivity-adjusting reading operation.

26. A method according to claim 19, wherein the image reading sensitivity of the photosensor array is  
25 set by adjusting a charge accumulating period of the photosensor.

27. A method according to claim 19, wherein the



extracting the image reading sensitivity comprises :

5 extracting maximum and minimum values of the  
measurement amount relating to the image pattern of the  
subject image for each image reading sensitivity on the  
basis of the subject image read by the sensitivity-  
adjusting reading operation;

10 calculating a dynamic range of the measurement  
amount on the basis of the maximum and minimum values  
of the measurement amount extracted for each image  
reading sensitivity; and

extracting an image reading sensitivity having  
a maximum dynamic range among dynamic ranges of  
measurement amounts calculated for each image reading  
sensitivity.

15 28. A method according to claim 19, wherein the  
extracting the image reading sensitivity comprises:

20 calculating a displacement of the measurement  
amount relating to the image pattern of the subject  
image between image reading sensitivities on the basis  
of the subject image read by the sensitivity-adjusting  
reading operation; and

extracting an image reading sensitivity at which  
a displacement of the measurement amount between image  
reading sensitivities maximizes.

25 29. A method according to claim 19, wherein the  
extracting the image reading sensitivity comprises:

extracting maximum and minimum values of the

measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reading operation;

5           calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity; and

10           extracting an image reading sensitivity at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic range between image reading sensitivities minimizes.

15           30. A method according to claim 19, wherein the extracting the image reading sensitivity comprises:

20           extracting maximum and minimum values of the measurement amount relating to the image pattern of the subject image for each image reading sensitivity on the basis of the subject image read by the sensitivity-adjusting reading operation;

          calculating a dynamic range of the measurement amount on the basis of the maximum and minimum values of the measurement amount extracted for each image reading sensitivity;

25           extracting a specific value at which the dynamic range of the measurement amount for each image reading sensitivity maximizes and a displacement of the dynamic

range between image reading sensitivities maximizes;  
and

5 determining presence/absence of an abnormality  
contained in the subject image on the basis of the  
specific value.

31. A method according to claim 19, wherein the  
extracting the image reading sensitivity comprises:  
removing an abnormal value deviating from a main  
change trend of the measurement amount, from the  
10 measurement amount relating to the image pattern of the  
subject image for each image reading sensitivity.

32. A method according to claim 31, wherein the  
removing the abnormal value from the measurement amount  
comprises:  
15 performing Fourier transformation for the measure-  
ment amount and removing a predetermined high-frequency  
component from the frequency-converted measurement  
amount.

33. A method according to claim 19, wherein  
20 each of the photosensors has a source electrode  
and drain electrode formed via a channel region made  
from a semiconductor layer, and a top gate electrode  
and bottom gate electrode formed at least on and below  
the channel region via insulating films,  
25 either of the top gate electrode and bottom gate  
electrode is used as a light irradiation side, and  
charges corresponding to a light quantity

irradiated from the light irradiation side are generated and accumulated in the channel region.